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**THE PHILOSOPHER AHEAD OF HIS TIME.
LUDWIK FLECK AND THE COMPLEXITY OF SCIENCE
(COMMUNICATION AND NOTES)**

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ABSTRACT

The new edition in Italian of the articles by the Polish microbiologist and philosopher Ludwik Fleck (1896–1961) edited by Francesco Coniglione offers the opportunity for some considerations around this significant scholar. Fleck anticipates Kuhn’s ideas as well as those of the sociology of science. For him, any epistemology that does not take psychological and sociological methods into account, or that does not concern itself with economics, technology, art, and even politics, is an *epistemology imaginabilis*. Here we discuss some key points of the essays collected in the book, some observations taken from the rich introduction of the editor, and an inevitable question: Why has Fleck been neglected for so long?

Keywords: Philosophy of science, sociology of science, Thomas Kuhn, Ludwik Fleck, thought collective, thought style.

The new edition in Italian of the articles by the Polish microbiologist and philosopher Ludwik Fleck (1896–1961) edited by Francesco Coniglione offers the opportunity for some considerations around this figure who was unjustly overshadowed for a long time. The essays, published in the original version between 1927 and 1960, are preceded by a rich introduction by the editor that contextualizes the themes and thematic relationships with the history and philosophy of 20th century science. In this context, Fleck’s work is central—and above all, ahead of his time—proposing a sociological and historicized reading of “scientific facts” so eloquent and visionary as to leave the reader amazed: because of the philosophical value of the essays and—at the same —because of the scant diffusion they had until recently.

Fleck is mentioned in the first pages of Thomas Kuhn’s seminal work. In the preface to the *Structure of Scientific Revolutions* (1962), he writes about “Ludwik Fleck’s almost unknown monograph” which “anticipates many of the ideas I formulated” (p. 8—the pages, where not otherwise specified, refer

to the volume of the edition edited by Coniglione, here translated by me into English). In later years, he explained that he had come across Fleck's philosophy thanks to a note contained in Hans Reichenbach's *Experience and Prediction* (1938) and that for years he had only met two people who had read it: the American sociologist Edward Shils and the Polish mathematician Mark Kac.

How impressed Kuhn must have been by his reading of Fleck is understandable both to the reader of the essays edited by Coniglione and to those who wish to rely on Michał Rydlewski's lapidary judgement: "There is nothing in the *Structure of Scientific Revolutions* that cannot be 'read' already in Fleck" (p. 42). This is particularly true—explains Coniglione—if we consider his analyses of the scientific community as a fundamental unit of the making of science and the general definition of paradigm, even if compared to the Kuhnian approach, in Fleck there is a more marked sociological characterization that "derives from the reading of the works of authors completely foreign to Kuhn: the school of Durkheim and Lévy-Bruhl, Mach, Wundt, Simmel, Le Bon, Freud, Kelsen, Jerusalem and especially Ludwik Gumplowicz" (p. 42).

Fleck's philosophical work is in strong dissonance with the *Received View*, developed from the reflection begun by the logical empiricists of the Vienna Circle, who conceded little or nothing to history and sociology when they described science as the mere product of logical criteria which—by leaning on their own internal hold and coherence—offer an increasingly broad and abstract vision of reality. These are themes dear to Francesco Coniglione, who has already dedicated several essays to them (including his *Popper Addio*, which is currently being re-edited) and which remind us how the internist school was the victim of that Ionic seduction "already present in the philosophy of the early Greeks: the mirage of a 'theory of everything' that embraces everything in a single formula, in the conviction that the universe is a *cosmos*, endowed with intimate unity, knowable rationally" (p. 17). A beautiful dream, and one that appealed not only to the Greeks when you consider that Einstein chased it for a lifetime.

The Vienna Circle would have to wait for Popper to see a timid approach to the historical and sociological perspective; but it would not be enough attention if it is true that, as late as 1978, Paul Feyerabend stated that logical empiricists and Popperians "are illiterate" in history and that their epistemology considers science as a timeless entity, offering only a caricature of its complex and real development (p. 20).

Many of Fleck's reflections refer to history and its sociological content. He is the author of two key concepts: the "style of thought" (*Denkstil*) and the "collective of thought" (*Denkkollektiv*), so named in his first and only monograph published in German (*Entstehung und Entwicklung einer wissenschaftlichen Tatsache. Einführung in die Lehre vom Denkstil und*

Denkkollektiv, B. Schwabe und Co. Verlabuchhandlung, Basel 1935) and translated into Polish only in 1986 (*Powstanie i rozwój faktu naukowego. Wprowadzenie do nauki o stylu myślowego i kolektywie myślowym*, Wydawnictwo Lubelskie, Lublin 1986). For Fleck, an epistemology that does not take psychological and sociological methods into account, or that does not concern itself with economics, technology, art and even politics, is an *epistemology imaginabilis*. He wrote about it in 1936, in the essay *The Problem of Epistemology*:

“The fundamental error in many discussions from the field of epistemology is the (more or less open) manipulation of the symbolic epistemological subject, known as ‘human spirit,’ ‘human mind,’ ‘research worker’ or simply ‘man’ (‘John,’ ‘Socrates’), which has no concrete living position [...]. That symbolic ‘human spirit’ is an asocial and ahistorical being: being the only one, unique, hence solitary, it has no communication with anybody, it does not enter into discussions, does not cultivate the art of imitation, has no companions, friends or enemies.”¹

In opposition to this hypothetical—as well as unrealistic—state of affairs, Fleck argues that cognitive activity should be considered a human practice immersed as much in history as in the sociological and emotional tensions that move life. This leads to a differentiation in human thought-groups. He writes: “there are people who can communicate with each other, i.e., who think somehow similarly, belong, so to speak, to the same thought-group, and there are people who are completely unable to understand each other and to communicate with each other, as if they belong to different thought-groups (thought-collectives). Scientists, philologists, theologians or cabbalists can communicate with each other perfectly well within the limits of their collectives, but the communication between a physicist and a philologist is difficult, between a physicist and a theologian very difficult, and between a physicist and a cabbalist or mystic impossible” (Fleck 1936, *ibid*, p. 81).

It should also be borne in mind that “an individual belongs to many thought-collectives” towards whom he or she presents different degrees of integration and competence (p. 88). We must therefore ask ourselves about the basis on which the subject chooses the style most congenial to them. Is this the one that seems to offer them a more effective heuristic tool for the given type of reality? Is it what habit or chance brings them? Is it a consequence of an emotional fact, such as a youthful infatuation with one discipline or another? There is no single or universal answer to these questions. It must be assumed that the style or styles are not chosen consciously, but

¹ L. Fleck, *The Problem of Epistemology*, 1936; then in *Cognition and Fact. Materials on Ludwik Fleck*, R. S. Cohen, T. Schnelle (eds.), Boston Studies in the Philosophy of Science, D. Reidel Publishing Company Dordrecht 1986, pp. 79–112, cited pages: 79 and 80.

are induced by a series of psychological, cultural, social, and even random elements that change from time to time in their proportions and assortments.

Added to this is the possibility of a coexistence of styles and their simultaneous use with varying degrees of mutual overlap or exclusion: when the physicist goes to the laboratory and speaks with colleagues, he or she adopts the common style of thought that allows him or her to speak with them; but when he or she goes to listen to the opera at the opera-house, he or she can adopt another style of thought, depending on the company he or she keeps and with whom they identify and have a close relationship with; and if he or she practices astrology or magic (something that even physicists have done) he or she will no longer speak in the style of the physicist, but in the style of thought (language, etc.) that allows him or her to be understood by those who share their astrological interests.

The essays in the book decline the features of a sociological and historiographic epistemology, rich in case studies: microbiology, concepts of time, definition of space, cosmological systems and much more. The reader can only ask himself the question: Why has Fleck been neglected for so long?

Francesco Coniglione puts forward hypotheses under the eloquent title *Far from Vienna, Far from Lvov* in reference to a series of historical events and the hegemony of the School of Lvov-Warsaw, founded in 1895 by Kazimierz Twardowski in Lvov. Coniglione writes:

“Within the Lvov-Warsaw School, the only representative of the Lvov-Warsaw School to have taken a public position not on his book, but on an article by Fleck (1936) was Izydora Dąmbska (1937), as if she had been entrusted with the task of distancing herself from Fleck’s conceptions with an intervention that set a stone over his thought, first of all criticizing the relativization of empirical statements. [...] The incipit of the Dąmbska article is as programmatic as ever of the sense of her criticism.” In fact, it starts from Gorgia’s third thesis to conduct a condemnation of Fleck’s philosophy “because of its cognitive relativism, which undermines the most deeply rooted and I would say unanimously shared conviction not only of the Polish School, but also of all neopositivism: the capacity of scientific knowledge to reach a shared, intersubjective knowledge” (p. 73).

We may add one more topic to Coniglione’s list, or at least give it more prominence: Fleck’s life history. Born in Lvov on July 11, 1896, with the outbreak of war and the surrender of the city to Soviet rule, Fleck had positions both in the new university and in other institutions. From 1923 to 1935, he worked in the department of internal medicine at the General Hospital of Lvov, then became director of the bacteriological laboratory of the local social security authority. Under the German Nazi occupation, Fleck was deported with his wife Ernestina Waldmann and son Ryszard to the Jewish ghetto of the city. Fleck’s work in the microbiological field was known to the

Germans who arrested him in December 1942, together with his family, and deported him to the pharmaceutical factory “Laokoon” to develop a typhus vaccine. On February 7, 1943, Fleck and his family were arrested again and locked up in Auschwitz concentration camp where the scholar was able to witness the atrocities of the Nazi experiments. His task was to diagnose syphilis, typhus, and other diseases with serological tests. From December 1943 until the liberation of Poland on 11 April 1945, Fleck was detained in the Buchenwald concentration camp. Here, as Arthur Allen recounted in his book (*The Fantastic Laboratory of Dr. Weigl. How two Brave Scientists Battled Typhus and Sabotaged the Nazis*, W. W. Norton & Company, New York 2014), Fleck risked his life (and those of his wife and son) by carrying out a complicated subterfuge in order to create two types of vaccine: an effective one that was used for prisoners in hazardous areas of concentration camps, and a completely ineffective one that was administered to Nazi soldiers.

However, the deportation to Buchenwald to produce the vaccine was epistemologically stimulating due to the fact that here he witnessed what had already been done by those who were already working for this purpose; he thus realized the errors of self-conviction that a community of scientific operators who are not sufficiently aware of the epistemological aspects of a social nature that affect their work can encounter. At a certain point in the work, the community of researchers believed that they had isolated samples of *Rickettsia*, the kind of gram-negative bacteria responsible for the exanthematous or petechial typhus infection. The vaccine could then be isolated from those preparations.

“*Rickettsia* has been found in the preparations obtained from rabbits’ lungs. When the joyful tidings spread among the collective, the certainty of the result became doubtless: the collective placed its trust in the boss, the boss relied on the opinion of his ‘specialists’ which he had corroborated in order to bear out his own authority, and these ‘specialists’ might have, at the outset, felt that this might have been something rather involuntary, but the general consensus dispelled all doubts.”²

After the war, between 1946 and 1957 he published 87 medical and scientific articles in Polish, French, English and Swiss journals. In 1951, Fleck received the National Prize for scientific achievements, and in 1955 he was awarded the Official Cross of the Order of the Renaissance of Poland. In 1956, after a heart attack and the discovery that he suffered from lymphosarcoma, Fleck emigrated to Israel where a position was created for him at the Israel Institute for Biological Research. His health was deteriorating and

² L. Fleck, *The Problem of Epistemology*, 1936; then in *Cognition and Fact. Materials on Ludwik Fleck*, op. cit., pp. 79–112, pp. 113–128, cited p. 120.

he had only the strength to write an article in 1960 on styles of thinking in relation to a discussion that had taken place in the journal *Science* on the theme “Science and Human Value.” He did not have time to speak further on this debate: he died in Ness Ziona, Israel, on July 5, 1961 from a second heart attack.

In the end, you could say that he did not have enough time. A century and a half before, in Italy, a similar lack of time prevented Luigi Galvani from having the success he deserved in the diatribe with Alessandro Volta on the causes of the electric charges that caused the movement in animal tissues. In 1801, Volta had been invited to Paris to demonstrate to Napoleon how his stack worked: the overlapping of metals could in fact generate an electric fluid which seemed to refute Galvani’s idea that animals had their own electric current. Galvani—who, as subsequent studies would show, was as right as his opponent—was unable to respond. In the meantime, French troops had invaded Italian territory, asking the citizens to take an oath to the Cisalpine Republic. The Bolognese scholar refused. He was then dismissed from office and deprived of his salary. A few weeks later, overcome by despair and illness, he died at his brother’s house.

Like Galvani, Fleck lacked the time to take advantage of the new debate that in 1960 had—as we have seen—taken place in the journal *Science*. But there is perhaps another reason for the lack of attention received by Fleck’s ideas. They were certainly of value, if they were to constitute the central nucleus of Kuhn’s famous work, dealing with themes then shared by countless scholars. The sad fact that Fleck’s work was mysteriously unsuccessful can be traced back to the isolation suffered by the Polish scholar. In short, Fleck lacked—in the philosophical field—the presence of an appropriate social density, the parameter that depends on “the number of ties between the members of a collective of people.” Fleck maintains that such density often acts as a brake on the free creativity of the scientist. He writes:

“If we call ‘social density’ the quantity of links between the members of a collective of people, then the difference between a collective of artists and a collective of scientists can be considered simply as a difference of this density: the science collective has a much higher density than the art collective. The resistance that holds back the researcher in his free creativity, this ‘hard ground of reality’ that he feels in the course of his work, depend precisely on this density.”³

It must be said, however, that—according to Fleck’s own model—it is precisely the links of the thinking collective that drive an idea or its author towards a rapid and positive affirmation. Without this crowding of interests

³ Response to the Observations by Tadeusz Bilikiewicz, 1939, quoted by F. Coniglione (ed.), op. cit.

and consensus, the idea remains in the shadows, and its author a marginal scholar. I believe, for example, that in this light one can look at the success of James Watson's presentation of the DNA structure at the Cold Spring Harbor symposium. Young, struggling with a revolutionary idea and confined in the remote spaces of a small room that had been reserved for him, certainly would not have received any interest or success if it had not been for his teacher—Max Delbrück—who was enthusiastic about the student's results and, strong in his undisputed authority, had taken care to distribute copies of Watson and Crick's article to all colleagues present.

It may be believed that the freedom of thought that Fleck enjoyed was made possible by his independence from the philosophical circles of the time. In return, Fleck had to pay a "small" price: oblivion.

It must also be said that Fleck was not the first to have formulated sociological ideas about science and—as Coniglione points out—it is possible to find "numerous announcements, especially following the research in the historical-artistic field carried out by Heinrich Wölfflin in the Warburg School, to which Cassirer, Olschki and Mannheim [...] Pierre Duhem, Erwin Schrödinger and others were receptive to some extent." In his beautiful introduction, Coniglione then addresses the whole question of the similarities between Fleck's intellectual reflection and that of authors such as Gilbert Ryle (author of the distinction *Knowing That. Knowing How*) or Michael Polanyi (to whom we owe the famous phrase "we know more than we can say").

The reader will find a great deal of food for thought in this collection of essays and will appreciate the careful editing. For my part, I subscribe to the view that it is not a matter of discovering *a Kuhn thirty years earlier*. Fleck is much more than that. His thought moves with autonomous and visionary sensitivity. The collection of his essays belongs to those readings that have the property of generating new ideas in the reader and making him see realities and scenarios never imagined in the past. It is no coincidence that when he spoke about reality, Fleck advised: "keep in your thoughts a free space for the future!" (p. 132).

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